

TIME- AND LABOR-SAVING EQUIPMENT FOR THE LAYING HOUSE

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A good, comfortable laying house well furnished with time- and labor-saving equipment is the pride and aspiration of all poultrymen. In many respects regardless of the house itself it is the inside furnishings that largely determine whether a poultry house as a whole is satisfactory or not. Although the primary function of the house is weather protection, it is well arranged time- and labor-saving equipment that gives it the finishing touches.

There are four principal routine activities in the care of layers: feeding, watering, gathering the eggs, and removal of droppings and floor litter. Anything that makes these duties more pleasant and less burdensome is much to be desired, and incidentally any time and labor saved reduces the cost of producing each dozen of eggs. Poultry house equipment with which there is satisfaction in doing the work will generally mean better care of the layers. The equipment and devices which are to be discussed were designed to serve that purpose.

FEEDERS FOR LAYERS

The magazine or hopper type of feeder was popular 15 to 20 years ago. Then followed the open box feeders with revolving reel. The first designs of box feeders carried in a modified form the objection to the hopper idea, in that they had too much capacity; the mash only needed to be replenished once or twice a week. The first box feeders were 6 inches deep and 12 inches wide. These were unsatisfactory because it has since been learned that fresh mash should be fed one to three times daily in the amount that will about be consumed before the next feeding period. The stale mash in the bottom of the larger-sized box feeders often becomes caked with must and mold and a total loss. This can be avoided by more frequent feeding of fresh mash in limited amounts and the ease with which the birds can clean up the mash from the bottom of a box feeder not more than 4 inches deep and 8 inches wide inside. Two feeders 8 feet long should be provided for each 100 layers.

The use of droppings pits with roosts 12 to 18 inches above the floor makes it desirable to place the feeders as close to the floor as possible to discourage the birds from roosting on the feeder stands, but the feeders should not be so low that the birds will scratch floor litter into them.

When the standing board is within the customary 3 to 4 inches of the top of the feeder box, the birds often stand on one foot with the other on the top edge of the feeder box while eating thus keeping the edges of the feeder filthy and contaminating the feed. To prevent this the 2 by 2-inch pieces upon which the birds stand while eating are placed 6 inches below the top of the feeder box and 4 inches out from the sides of the feeder, so that the birds have to stand on both feet. The bird is then in a better position to eat from a feeder box 4 inches deep and 8 inches wide inside. Because of the lower position of the bird's body, there is less chance for the loss of the liquid contents of the crop than when the crop is at a higher level while the bird is eating, especially soon after a generous intake of water.

Figure 1 shows the model of the feeder which was designed by the Station to meet these requirements. The feeder box is 4 inches deep and 8 inches wide and equipped with a revolving pole. Plaster lath are placed on the top edges of the feeder and extend $\frac{3}{4}$ inch inside to prevent wastage of feed. A 6-inch

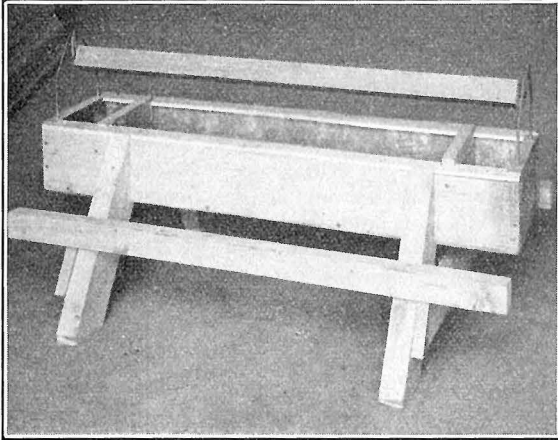


Fig. 1.—Feeder for layers

compartment is provided on each end—one for oyster shells or limestone grit and the other for granite or quartz grit. The revolving pole is supported by brackets made of number 6, 7, or 8 galvanized steel wire so as to give 3 inches of clearance between top of feeder and bottom of pole. The feeder stand consists of four 2 by 4—inch pieces 16 inches long with ends tapered to fit the box and to give a level footing on the floor. A notch is made in the legs to receive the standing pole so that the top of the pole will be 6 inches below the top edge of the feeder box and 4 inches from the side. The 1 by 4—inch pieces are 25 inches long and tie the legs together. The top edge of the 1 by 4's is placed firmly against the bottom of the standing pole. The outside spread of legs at the bottom is about 25 inches. The tops are about $9\frac{1}{2}$ inches apart to receive the feeder box.

Some may prefer to support the feeder box and standing poles by means of a 2 by 4 and a 2 by 6 placed edgewise and across 1 foot from each end of the feeder (Fig. 2). The 2 by 4 is placed above with the upper corners cut out to give the standing poles proper position.

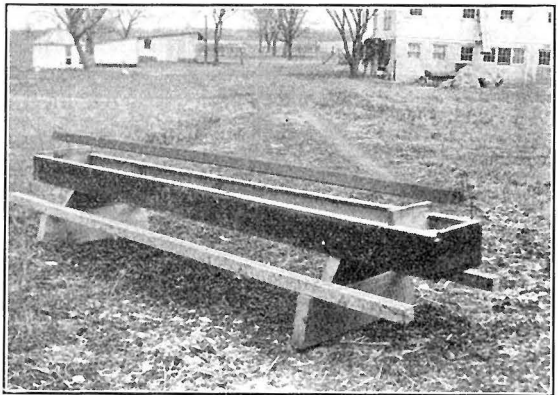


Fig. 2.—Feeder box with low stand

The list of material for one feeder (Fig. 1) 8 feet long (lumber should be white pine or spruce) is:

One	1 inch	by 8 inches,	8 feet	long—bottom
Two	1 inch	by 5 inches,	8 feet	long—sides, or one 1 inch by 10 inches, 10 feet long
Two	1 inch	by 5 inches,	8 inches	long—ends
One	2 inches	by 2 inches,	8 feet	long—revolving pole
Two	2 inches	by 2 inches,	8 feet	long—standing poles
Four	2 inches	by 4 inches,	16 inches	long—legs of feeder
Two	1 inch	by 4 inches,	25 inches	long—ties across bottom of legs

Two feeders 8 feet long should be provided each 100 layers.

WATERING DEVICE

Fresh, clean water is one of the major requirements of layers. Fortunately, with proper equipment the time and labor for providing water can be made less than those of any of the other routine requirements in the care of layers. The first essential is to have running water in the laying house. Then one water trough installed in the partition (Fig. 3) will serve two pens each of one to three hundred layers and watering need not involve more than 2 minutes of the caretaker's time daily. Smaller flocks will require more time in proportion to the number of birds. Nevertheless, any time beyond 2 to 3 minutes per 100 layers daily should be considered wasted and a needless cost added to the cost of each dozen eggs produced.

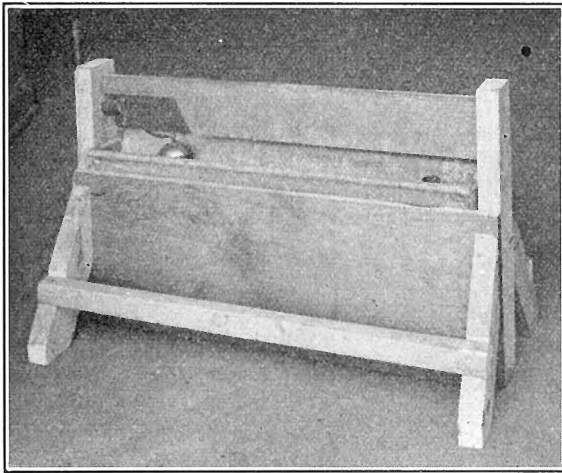


Fig. 3.—Watering device

When there are two or more pens in the laying house, it is generally preferable to install the watering device in the partition. The device shown in Figure 3 is the result of many trial-and-error procedures at the Station to develop a suitable watering device which would avoid dampness of near-by floor litter. The latter proved no simple problem. It took considerable time to discover why the near-by floor litter on one side of the partition remained dry while at the same time it was invariably wet on the other side. Finally, it was

found that the wet litter was due to two causes: (a) The space between the edge of the trough and the partition board was a little greater on the wet side. (b) The standing pole was a little closer to the trough so that some of the birds would drink while standing on the floor instead of getting up on the pole. With these differences corrected, the litter on both sides remained dry. Hence it is necessary to pay special attention to the width of the drinking space and the location of the standing pole to secure the desired position of the bird while drinking.

Another solution of the damp litter problem is the use of removable wire frames on each side of the water trough. These frames should be made of 1 by 6-inch pieces edgewise covered with $\frac{3}{4}$ -inch mesh woven wire or 1 by 2-inch mesh number 14 gauge welded wire. The frames are 10 inches wide and the length is that of the trough. Where the frames are on a concrete floor the floor may be sloped to the drain to carry off any waste water. On a wood floor the frames can be set in a galvanized pan with sides 1 inch high and just large enough to receive the frames. The pan is equipped with a 1-inch nipple 1 inch in diameter extending an inch below the bottom to carry the waste water into the drain pipe.

The tile drain pipe 4 inches in diameter should lead to a rock pit not less than 15 to 20 feet away from the building or into some other drainage facility.

The trough, Figure 3, is a 5-inch galvanized gutter pipe preferably beaded (turned) on both sides. The length is in proportion to the number of layers to be served; that is, 4, 6, 8, and 10 feet for 100, 150, 200, and 250 layers, respectively, on each side of the partition. A ready-made galvanized iron trough 3 inches wide at the top, $1\frac{1}{2}$ inches wide at the bottom, $2\frac{1}{2}$ inches deep, and equipped with a drain can be secured from poultry equipment dealers or manufacturers. It is preferable to and less expensive than the 5-inch gutter or eaves trough.

The water is delivered under pressure at one end of the trough and controlled by a float valve or by drip from the faucet. A drain $\frac{3}{4}$ to 1 inch in diameter is provided at the other end of the trough over the drain pipe. The overflow is of such length as to maintain about 1 inch of water in the trough. To clean the trough the overflow drain is removed, the water is turned on to flush out the trough, and a suitable brush is used to clean the trough.

The partition board is placed above the top of the trough so that there is a clearance of 2 inches for drinking space on each side. The edge of the trough is 14 inches above the floor. The standing pole is placed so that the top is 5 inches above the floor, 9 inches below the top edge of the trough, and 5 inches out from the edge of the trough. Where it is not desired to use this device in the partition, a revolving pole should be put on top to prevent roosting.

BOX NESTS

Box nests are simpler in construction and less expensive than single nests. They require but half the wall space of single nests. A box nest 8 feet long serves 100 layers.

Box nests are 20 to 24 inches wide, 16 to 18 inches high, and 4 to 10 feet long. The nest partitions are 8 to 10 inches high and are placed 20 to 24 inches apart. The model, Figure 4, shows rear and end views of a top and bottom section. The top section merely rests on the bottom section. The bottoms are made of two 1 by 10- or 12-inch boards. The sides of nests to retain litter

are 6 inches wide. The hens enter from the rear to lay and the eggs are gathered from the front. The front entrance for gathering the eggs (rear of Figure 4) is closed by a board 10 inches wide hinged at the bottom. The nests are placed 8 inches away from the wall or partition. Two 1 by 2-inch strips spaced 1 inch from the side of the nest and 1½ inches apart and supported by cleats permit the hens to enter the nest from the rear. The sloping top extends beyond the rear of the nests to the wall. The nests are supported 12 to 16 inches above the floor by means of brackets or horses.

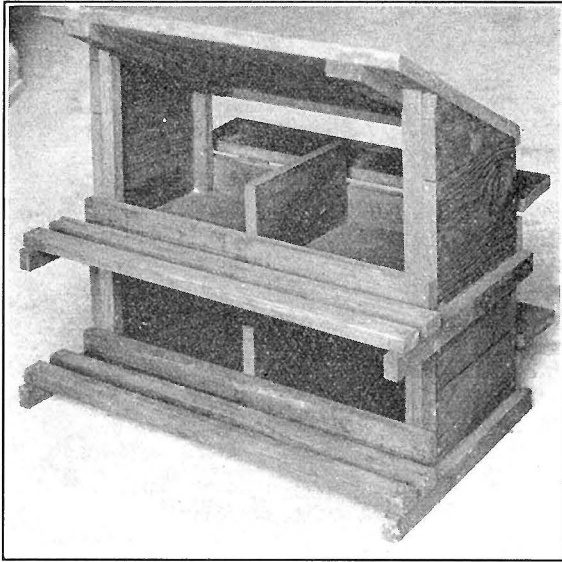


Fig. 4.—Box nest

These box nests are designed to reduce the number of soiled and broken eggs and protect the hens from needless disturbance often observed in single nests. It is believed that these objects are largely accomplished because of the uniform restriction of light in these nests and their roominess. There are four favorite corners for laying in each compartment.

DROPPINGS PITS

New laying houses should be equipped with droppings pits, and laying houses with droppings boards can be greatly improved and modernized by the installation of pits. The pits do not reduce the bird capacity of the laying house. The air is as free of odor as with droppings boards when 2 or 3 inches of straw or other coarse litter material is placed on the floor below the roosts. This litter protects the floor and permits air circulation from below and around the droppings to facilitate the loss of moisture, thus reducing the frequency of removal of the droppings to 4 to 6 times a year.

Droppings pits are being used by the Station in almost all types of laying houses. They vary from a two-roost pit in a long, narrow house to pits in the

central portion of a room 40 by 60 feet. Experience with the pits in different types of housing and under a variety of conditions, including hot and cold weather, has demonstrated the following distinct advantages:

- Less frequency of cleaning and less labor
- Less floor area to be covered with litter
- More day droppings in pits and less in litter because of the greater use of roosts over pits during the day

When layers are inactive they find better seclusion and less interference from other birds when on roosts than when squatting on the floor. This may tend to lessen the liability of feather picking and cannibalism.

The liability of layers' being injured by jumping from high roosts is avoided. Some claim that low roosts lessen the number of eggs with blood spots.

Ventilation and air conditions are better with floor roosts than when the roosts are above droppings boards.

INSTALLATION

Figure 5 is self-explanatory except for a few points. The roosting frame is sloped upward so that the rear of the frame is 4 to 10 inches higher, depending upon the width of the frame, than the front.

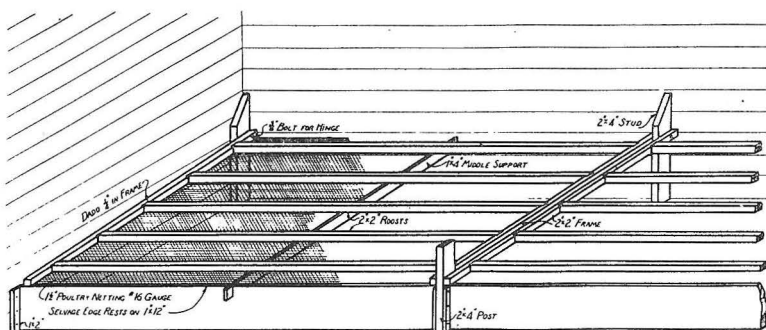


Fig. 5.—A five-roost droppings pit for a laying house 24 feet wide

Roost frames may be 2.5 to 10.5 feet wide and 5 to 10 feet long. Table 1 gives the width of pit and number of roosts for different widths or depths of laying houses in which the roosts extend the entire length of the pen.

TABLE 1.—Width of Pit and Number of Roosts for Laying Houses

Width or depth of laying house	Width of pit from front to rear		Number of roosts parallel to front and rear
	Light breeds	Heavy breeds	
<i>Fl.</i>			
16.....	3 ft. 6 in.	4 ft. 0 in.	3
20.....	4 ft. 6 in.	5 ft. 0 in.	4
24.....	6 ft. 0 in.	7 ft. 0 in.	5
30.....	7 ft. 0 in.	8 ft. 0 in.	6
36.....	9 ft. 6 in.	10 ft. 6 in.	8

The calculations in Table 1 are based on 3 to 3.5 square feet of floor space and 8 linear inches of roost for each bird of the lighter breeds. For heavier breeds, the calculations are based on 4 square feet of floor space and 10 linear inches of roost per bird. The roosts are spaced 14 inches center to center for lighter breeds and 16 inches for heavier breeds.

It is important that the wire under the roosts be either 1½-inch mesh, number 16 gauge wire or 1 by 2-inch mesh number 14 gauge welded wire. When a width of wire corresponding to the width of the pit is not available, two narrower widths which will give the desired total width can be joined by means of hog rings.

The 1 by 12-inch boards which enclose the front of the pit can be made removable or fixed permanently in place as may be preferred.

The pits may be located next to the rear wall or in the center of the room, depending upon the width or depth of the laying house.

TIME-SWITCH DEVICE FOR LIGHTING THE LAYERS

When artificial light for layers is desired, it is generally morning light. The lights can be turned on when desired by a clock device and turned off later by the caretaker. A simple, dependable device for switching on the lights is shown in Figure 6. It consists of an alarm clock mounted upon a block 2 inches high, 3 inches wide, and 4 inches long placed crosswise of the end of the baseboard, which is a 1 by 4-inch piece 29 inches long. Another block 1½ inches high to catch the arm above when it falls is attached 9 inches from the clock end of the baseboard. The push-button switch-lighting button is 14½ inches from the clock end and 1 inch from the edge.

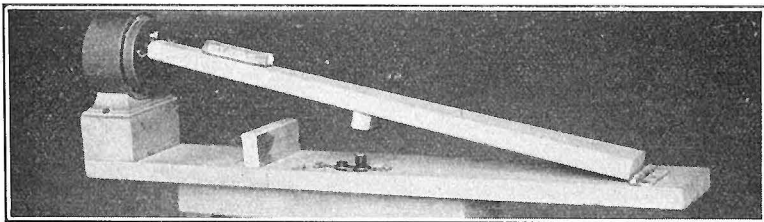


Fig. 6.—Time-switch device for lighting the layers

The clock lever or arm is 23 inches long and tapered from 2 inches on the hinge end to 1 inch on the clock end, into which a number 10 screw 1½ inches long is put in the center so that it projects ½ inch. The screw end of the arm is placed in proper position on the winding key to the alarm; the other end is fastened securely to the baseboard by means of a 2¾-inch tee hinge. When set for action the screw rests upon the winding key of the alarm until the alarm goes off; then the weighted arm drops onto the lighting (ON) switch button (or a knife switch) and switches on the lights. The weight on the clock lever may be of lead or iron sufficient to push on the switch when the lever falls. The weight can be placed closer to or farther from the clock end of the lever as may be necessary to operate the switch properly. The block

attached to the underside of the arm is $1\frac{1}{2}$ inches long and extends $\frac{3}{4}$ inch below. It is padded with a $\frac{1}{16}$ - to $\frac{1}{8}$ -inch cushion of leather or rubber to cushion the shock when it strikes the switch button.

The device may be located where desired by attachment to brackets or a shelf.

AN EASY TWO-WAY, SURE-TO-CLOSE PARTITION DOOR

When the brooder or laying house is divided into pens, partition gates or doors become necessary. Such a door should be light, durable, inexpensive, easily opened from either side by pressure (which means no latch) and should always shut securely to prevent mixture of the birds in adjoining pens. Figure 7 shows a door designed by the junior author to meet these requirements. The door was propped open while the photograph was taken. In use, the weight always holds the door securely closed.

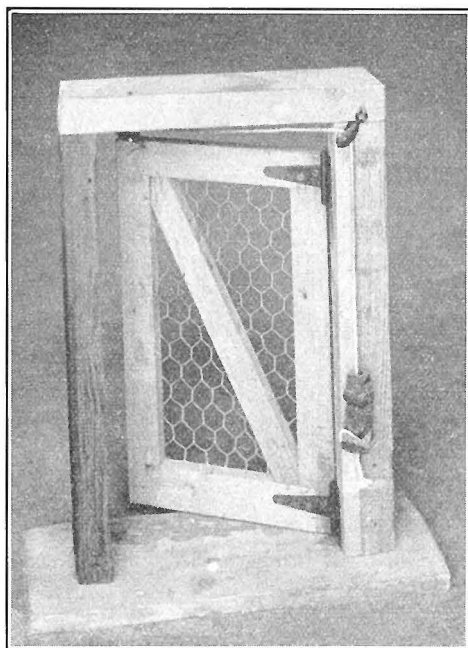


Fig. 7.—A two-way self-closing partition door

The frame of the door is made of 1 by 4 - inch material with a 1 by 3 - inch diagonal brace. The hardware consists of two 3-inch tee hinges, two 1-inch awning pulleys, sash cord, and a weight sufficient to close and hold the door closed as desired. The usual dimensions of the door are 30 to 36 inches wide and 6 feet high, but may be varied in accordance with special requirements. It is generally advisable to have a board 6 to 10 inches wide across the bottom of the doorway so that the bottom of the door will swing free of the floor litter.